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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JONES, HUGH M

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/471,220

Applicant(s)

POLLARD ET AL.

Examiner

Hugh Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/19/2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-7 and 9-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7 and 9-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/19/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3, 5-7, 9-25 of U.S. Application 09/471,220 filed 12/23/1999 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1, 3, 5-7, 9-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.** The instant claims recite: determining, translating, adjusting (see claim 1; for example); monitoring, reducing. The Examiner referred to the specification in order to determine Applicant's teachings as it applies to the claims. The specification alleges that the present invention can be practiced with only some of the aspects or without the specific details (paragraphs 2-3, page 5, specification); that the order of the description is irrelevant (first full paragraph, page 6, specification); and that (first full paragraph, page 6, specification):

Lastly, repeated usage of the phrase 'in one embodiment' does not necessarily refer to the same embodiment, although it may.

4. The Examiner submits that such statements in the specification are confusing and an attempt to add material which has not been expressly disclosed or properly incorporated. **The specification contains subject matter which was not described**

in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention without undo experimentation.

5. **Claims 1, 3, 5-7, 9-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.** The instant claims recite: determining, translating, adjusting (see claim 1, for example); monitoring, reducing. The Examiner referred to the specification in order to determine Applicant's teachings as it applies to the claims. The specification alleges that the present invention can be practiced with only some of the aspects or without the specific details (paragraphs 2-3, page 5, specification); that the order of the description is irrelevant (first full paragraph, page 6, specification); and that (first full paragraph, page 6, specification):

*Lastly, repeated usage of the phrase in one embodiment does not necessarily refer to the same embodiment, **although it may.***

6. The Examiner submits that such statements in the specification are confusing and an apparent attempt to add material which has not been expressly disclosed or properly incorporated. **The specification contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. **Claims 1, 3, 5-7, 9-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Statements that the present invention can be practiced with only some of the aspects or without the specific details (paragraphs 2-3, page 5, specification); that the order of the description is irrelevant (first full paragraph, page 6, specification); and that (first full paragraph, page 6, specification) *Lastly, repeated usage of the phrase in one embodiment does not necessarily refer to the same embodiment, although it may* renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed, thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Interpretation

9. The broadest, most reasonable interpretation has been provided to the claims. Applicants have provided many caveats (discussed earlier) as it relates to the specification. *The Examiner interprets that the specification comprises only that which is expressly disclosed within **the four corners** of the specification.* The Examiner further notes Applicant's *admission* that the present invention can be practiced with only some of the aspects or without the specific details (paragraphs 2-3, page 5, specification) and that the order of the description is irrelevant (first full paragraph, page 6, specification).

Claim Rejections - 35 USC 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating

obviousness or unobviousness.

12. Claims 1, 3, 5, 9-13, 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Bhatia et al. ('798) or Lin ('885)] in view of [Hafizi et al. or Herbert ('667) or Rankin et al. ('374)].

13. Bhatia et al. disclose a system including a component (e.g., a processor) with a clock and a thermal management controller that monitors a temperature in the system. The thermal management controller varies the component between different performance states (e.g., cycles the processor between a high and a low performance state) when an over-temperature condition is detected. The thermal management

controller further throttles the clock of the component while in the low performance state until the over-temperature condition is removed. See fig. 2-3, 8, 9, 15 and corresponding text. Bhatia et al. disclose storing the thermal management program in BIOS (col. 7, lines 53-65; col. 9, lines 12-26; col. 12).

14. Lin discloses over an temperature protection method and its circuital device for a central processing unit includes a read and write memory unit having pre-stored therein; an instruction for identifying a type of CPU and automatically predetermining the maximum allowable over temperature for the CPU. An over temperature is detected by a heat sensitive resistance installed at the space immediately under the CPU to cause an audio frequency alarm circuit to output a sound alarm and also cause the CPU to slow down its operation speed to an appropriate reduced rate to prevent CPU from being damaged by over heat or other loss caused by interrupting CPU operation. After recovery of temperature to a normal value, the CPU can be instructed to operate with its normal speed. See fig. 1 and corresponding text; col. 2, lines 22-38.

15. The base references disclose all limitations, but does not expressly disclose that the critical temperature refers to the junction temperature.

16. Hafizi et al. disclose that the reliability of high-performance AlInAs/GaInAs heterojunction bipolar transistors. Devices with a base Be doping level of $5 \times 10^{19} \text{ cm}^{-3}$ and a base thickness of approximately 50 nm displayed no sign of Be diffusion under applied bias. Excellent stability in DC current gain, device turn-on voltage, and base-emitter junction characteristics was observed. Accelerated life-test experiments were performed under an applied constant collector current density of $7 \times 10^4 \text{ A/cm}^2$ at

ambient temperatures of 193, 208, and 328°C. **Junction temperature** and device thermal resistance were determined experimentally. Degradation of the base-collector junction was used as **failure** criterion to project a mean time to **failure** in excess of 10^7 h at 125°C **junction temperature** with an associated activation energy of 1.92 eV. See figure 9.

17. Herbert discloses controlling a clock rate for a device through the use of integrated circuits which respond to the temperature of the device. Circuitry is added to the integrated circuit device being controlled which changes the clock rate of the device as the device temperature changes. The device clock is thus regulating by the temperature of the device. The way in which the regulation is implemented can be varied, from slowing an internally generated clock rate, or by digitally scaling an external clock input. Synchronous scaling is also provided, such that devices which are connected external to the CPU can still be clocked at the same external rate, but CPU transactions within the CPU may occur at a different rate depending on the CPU's measured temperature. This invention also provides the ability to selectively reduce or stop certain areas of an integrated circuit relative to pending operations or instructions being executed. See particularly fig. 12-13 and corresponding text; col. 1, lines 8-60 (effect of temperature on semiconductor devices); col. 3, lines 8-66.

18. Rankin et al. disclose a method and apparatus for power throttling to manage the temperature of an IC. A temperature sensor is manufactured on the same die as the IC components. The temperature sensor generates an output in response to junction temperature of the IC components. A state machine is coupled to receive the output of

the temperature sensor and to provide power reduction functions in response to the temperature sensor output exceeding a maximum thermal value. The maximum thermal value is less than the maximum allowable temperature of the IC corresponding to maximum power consumption. Thus, the invention reduces power consumption at a thermal value lower than a potentially catastrophic value rather than shutting down the IC when catastrophic failure is imminent. See particularly fig. 1-3 and corresponding text.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to take into consideration a maximum junction temperature because transistor failures are caused by over-temperature at the transistor junction. For example, see Hafizi et al. which disclose that failure rates increase with increasing temperature.

20. Claims 6-7, 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Bhatia et al. ('798) or Lin ('885)] in view of [Hafizi et al. or Herbert ('667) or Rankin et al. ('374)] and in further view of [Woo et al. (>768) or Bogin et al. (>685)].

21. The applied references do not expressly teach concentrating on thermal management issues as it relates to memory.

22. Woo et al. (>768 - IDS) disclose a memory system configured to provide thermal regulation of a plurality of memory devices is disclosed. The memory system comprises a memory module having a plurality of memory devices coupled to a bus. Additionally, the memory system also comprises a controller coupled to the bus. The controller determines an operating temperature (actual or estimated) of the memory device. Based on the determined operating temperature of the memory device, the controller is

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further operable to manipulate the operation of the memory system. See Abstract; fig. 3, 4, 6, 7, 10, 11 and corresponding text.

23. Bogin et al. disclose a thermal management program wherein memory access rate is correspondingly controlled. See fig. 2-4 and corresponding text.

24. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply thermal management techniques to memory because memory is accessed in virtually all computer operations (for example, ALU operations are less frequent). Thus thermal management issues can be more accurately characterized by correlating thermal management issues with memory access.

Response to Arguments of May 19, 2005

25. Applicant's arguments filed 5/19/2005 have been fully considered but they are not persuasive.

Response to Arguments – 112(1) Rejections (pp. 8-10)

26. Applicant's arguments filed 5/19/2005 have been fully considered but they are not persuasive.

27. Respectfully, it is *impossible* to determine what invention is encompassed by such language and to thus determine the nature of the invention.

28. Applicants have alleged that the 112(1) rejections should be withdrawn because this is a common tactic. Such arguments are abstract and conclusory. In any case it is irrelevant whether this is a common tactic; the issue at hand is whether Applicants have

satisfied the requirements of 35 USC 112, first paragraph. Applicants have not persuasively addressed the merits of the rejection.

Response to Arguments – 112 (2) Rejections (pp. 10-11)

29. Applicant's arguments filed 5/19/2005 have been fully considered and they are not persuasive.

30. Applicants are reminded that although limitations from the specification are not read into the claims, the claims are interpreted in light of the specification. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

31. Applicants have alleged that the 112(2) rejections should be withdrawn because this is a common tactic. Applicants have provided no legal authority for such a position. Such arguments are abstract and conclusory. In any case it is irrelevant whether this is a common tactic; the issue at hand is whether Applicants have satisfied the requirements of 35 USC 112, second paragraph. Applicants have not addressed the merits of the rejection. Applicants have only alleged that the specification is clearly written.

Response to Arguments – 103 Rejections (pp. 11-17)

32. Applicant's arguments filed 5/19/2005 have been fully considered but they are not persuasive.

33. Applicant's argument are typified by:

“...the present claims recite determining determining a maximum data rate based on characteristics of the integrated circuit and adjusting the operation of the integrated

circuit to not exceed the maximum data rate. Thus, the present claims do not claim adjusting the performance of an integrated circuit based on the temperature of the circuit, but rather, on the design of the computing system.”

34. This, respectfully, is not persuasive for the following reasons.

- Note lines 1-3, page 5 of the specification, which recite (emphasis added):

“The present invention provides for *dynamic **thermal** management of integrated circuits*, including memory modules, within a computer system.

The **thermal management methodology** described herein...”

- This reading of the claims is not supported by the specification or the express language in the claims. For example, consider figure 2. The last step requires “adjust operation of IC...”. That means the operation of the IC is dynamically changing. Consider dependent claim 2. The system characteristics are stored in the BIOS. The sustainable power level is determined based upon those stored characteristics in the chip. The operation of the “integrated Circuit” is then adjusted such that the data transfer rate is not exceeded. The art of record meets all the limitations. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *that the claims are restricted to design only instead of operation based upon the design*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

- Furthermore, it is noted that Applicants, in their arguments relating to the 103 rejections, do not point to any specifics in the specification. The Examiner referred to the specification in order to determine Applicant's teachings as it applies to the claims. The specification alleges that the present invention can be practiced with only some of the aspects or without the specific details (paragraphs 2-3, page 5, specification); that the order of the description is irrelevant (first full paragraph, page 6, specification); and that (first full paragraph, page 6, specification): *Lastly, repeated usage of the phrase 'in one embodiment' does not necessarily refer to the same embodiment, **although it may.***

35. Applicants argue that "Thus, the present claims do not claim adjusting the performance of an integrated circuit based on the temperature of the circuit, but rather, on the design of the computing system". Assuming Applicant's position, for the sake of argument, the argument is still not persuasive. *To carry out the adjustment, the system had to have been designed to carry out the adjustment.* In response to applicant's arguments, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a

process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

36. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

37. Applicants still have not explained why it would not have been obvious to one of ordinary skill in the art at the time of the invention to store the program in BIOS for the following reasons. Computers are sometimes shut down when the computer overheats. When computers restart, they access BIOS. Storing the thermal management program in BIOS would allow the computer to remember that there is a thermal management issue and adjust the clock rate accordingly upon restart. Applicants have not even attempted to explain why it would not have been obvious to one of ordinary skill in the art at the time of the invention to apply thermal management techniques to memory because memory is accessed in virtually all computer operations (for example, ALU operations are less frequent). Thus thermal management issues can be more accurately characterized by correlating thermal management issues with memory access.

38. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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39. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

40. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Dr. Hugh Jones telephone number (571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

or

the examiner's supervisor, Jean Homere, telephone number (571) 272-3780.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks
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or faxed to:

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

Dr. Hugh Jones
Primary Patent Examiner
August 01, 2005

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